Q1:

1. a sandwich pickled every pickle in every pickle .
2. every perplexed perplexed chief of staff under every chief of staff on every sandwich with the delicious floor in every pickle with a delicious sandwich pickled a sandwich with every chief of staff under every pickle under the sandwich on a sandwich under a president under every pickle with every floor on every president with a sandwich on a sandwich on the delicious fine president with every perplexed pickled floor .
3. a chief of staff understood the delicious sandwich with every floor !
4. the pickle ate every fine pickle !
5. is it true that every floor pickled a pickle with every chief of staff ?
6. is it true that a chief of staff pickled a pickle on a floor on a president in every fine sandwich with a perplexed floor on every president with every delicious chief of staff with a sandwich with the president on a sandwich on every floor under every sandwich with a chief of staff on a chief of staff on every president under the floor on the floor in the pickle on the sandwich with a floor under the sandwich in a floor on every chief of staff in a president under a chief of staff in a sandwich in the floor on every sandwich in every chief of staff with every president in a pickle on the floor in a floor under the pickle in the sandwich under a chief of staff with every sandwich with the chief of staff with a pickle on every delicious president with a president under every president under the sandwich under the president with the sandwich in a pickle in the floor with every floor on the floor in the floor on every sandwich with the chief of staff under every president in the floor with a floor in every sandwich with every delicious sandwich under the president with every pickle on a president on the president under every president under every president under every fine pickle in every pickled pickle on a delicious chief of staff in the floor under every fine sandwich with the sandwich with the pickle in every pickle on the perplexed floor under a chief of staff with a chief of staff with the chief of staff with a pickle with a president with the pickle on a chief of staff under the chief of staff with the president under the sandwich in the sandwich ?
7. a sandwich under a sandwich under a president under the president with a fine floor under every chief of staff on a chief of staff kissed the pickle !
8. is it true that every floor ate a president ?
9. is it true that the pickle in the president in a president in the sandwich under the floor on every floor under the sandwich under a pickle on a president in every chief of staff with a president under the sandwich in the perplexed floor with every floor on the chief of staff in a president with the president in a floor on the sandwich on every pickle in a floor under a sandwich in the pickle with every president under every pickle with the sandwich with a chief of staff with the pickle with the floor in the sandwich in the chief of staff with the president on the sandwich under the president under a floor under every pickle under a chief of staff on a chief of staff in the pickle with every pickle under every pickle with every fine president with a chief of staff under every pickle in the floor on a pickle on a president in the pickle with every pickle in a pickle under every sandwich under every pickle under every floor with a sandwich on the fine president under the pickle under every sandwich in every chief of staff in a pickled chief of staff in the sandwich in every sandwich in a floor in the chief of staff on every floor with every floor on a chief of staff in a floor on a chief of staff in every pickle with a perplexed president with every sandwich under the fine perplexed chief of staff on the delicious sandwich in every sandwich on the chief of staff in every floor with a floor under every delicious pickle under the pickle under the chief of staff under the chief of staff on a president in a delicious pickle pickled every delicious president ?
10. is it true that every floor with every pickle ate every floor under a president ?

Q2:

1. Cause there is a loop in the grammar given and there Is a large chance to get into the loop again and again. As a result, the program generated long sentences.

The responsible grammars are:

1 NP NP PP

1 PP Prep NP

1 Noun Adj Noun

All these grammars have self-loops or loop with others. eg. NP may generate PP and PP may generate NP, this is a loop

1. Because of the probability to generate multiple adjectives is low. For example, we have a Noun. Then the probability to generate 1 adjective is 1/6, the probability of generating 2 adjectives are 1/(6 \* 6) = 1/36 …..therefore there is small chance to generate multiple adjectives.
2. See the program
3. By increase the weight of

1 Noun Adj Noun to 10 Noun Adj Noun

and decrease the weight of

1 NP NP PP to 0.1 NP NP PP

1 PP Prep NP to 0.1 PP Prep NP

The result becomes much shorter with more like:

the fine floor understood every sandwich .

a pickled floor wanted every delicious delicious pickle !

the perplexed pickle on the delicious fine pickled delicious delicious delicious fine perplexed pickle understood the fine fine chief of staff .

the floor understood a fine president !

a fine perplexed chief of staff wanted the pickled sandwich under the perplexed fine chief of staff .

every fine perplexed president kissed the delicious perplexed fine chief of staff !

every pickled pickled fine floor kissed every perplexed perplexed perplexed chief of staff !

every floor kissed the president !

a fine delicious pickled fine sandwich kissed the fine delicious floor .

every fine fine fine chief of staff wanted every sandwich.

1. See the program

a president kissed the pickle !

is it true that a pickle with the floor kissed every sandwich with a floor with a floor ?

is it true that every floor wanted the floor ?

is it true that every president ate a president on a chief of staff ?

every pickle ate every pickle with a floor with a president on a sandwich with the

president with a chief of staff !

is it true that every chief of staff kissed every pickle with a chief of staff ?

is it true that every delicious floor wanted every president ?

is it true that a sandwich ate the chief of staff with a delicious pickled fine chief of

staff with every pickle on the president on every delicious pickle with the delicious pickle

with a floor on the floor in the chief of staff in every president with the pickle with every

delicious perplexed president ?

every pickle pickled every pickle !

the president with every perplexed chief of staff with every floor understood the

chief of staff !

Q3. See grammar3.gr

Sally under Sally or every sandwich with every chief of staff or every proposal in every proposal or the very perplexed president or Sally or Sally or Sally and a floor with every chief of staff and Sally or Sally and Sally with a chief of staff and every president on Sally kissed that the president and Sally and Sally or a proposal and every delicious pickle with Sally under Sally with Sally with a president on Sally under the floor or every sandwich and Sally in the pickle with a chief of staff under every proposal under Sally with the floor in Sally under Sally or Sally or Sally and Sally and the pickle under the proposal and the perplexed floor in the proposal and every president on Sally in every floor on Sally on every pickle with Sally under Sally and Sally or a floor and Sally with Sally or the pickle or a desk with Sally in Sally and every sandwich in Sally and Sally and a president and Sally and Sally or the sandwich and Sally and Sally on Sally or every president under Sally and a president on Sally under every sandwich on every floor with Sally on Sally under Sally on a pickled chief of staff and every very perplexed pickle kissed that a floor pickled that Sally with Sally under a chief of staff and Sally worked .

is it true that every pickle in every floor or Sally on the floor and Sally on a chief of staff or Sally and Sally or Sally under the desk under the chief of staff in the president and a proposal sighed and worked ?

is it true that the sandwich or Sally perplexed or wanted a president or the pickle ?

it pickled every president that the sandwich understood every desk .

that the sandwich and Sally or Sally and every sandwich on Sally and Sally in a president with a president with the perplexed proposal on Sally or Sally and every proposal or the chief of staff or Sally and Sally and Sally and Sally or Sally and Sally or Sally or a desk or Sally or a desk under Sally or Sally and Sally and Sally in a floor in Sally on Sally in the very pickled proposal and the fine chief of staff in the floor and every pickle or the proposal or Sally and Sally in a president and a pickle under Sally and Sally and Sally and Sally or every floor and the desk and Sally under Sally or the delicious sandwich and a fine floor or the floor or Sally with Sally under every delicious chief of staff in Sally under a president and Sally in Sally under Sally with the desk in Sally and the chief of staff and a president or Sally and a fine desk under Sally on Sally and the floor and Sally under Sally in every sandwich under the floor in the proposal or a president or the proposal in the floor and the perplexed chief of staff and Sally or the floor under a sandwich in the chief of staff on a floor with Sally with Sally and every president ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... .

a floor perplexed or wanted and thought that Sally in Sally or Sally under Sally or Sally sighed .

a floor and Sally under Sally understood that every proposal sighed .

it sighed with Sally and Sally or Sally or the sandwich on the pickle and Sally with the president and a proposal and Sally or Sally or the desk under a president or the very fine floor or Sally under Sally in Sally with a proposal with Sally with Sally and every proposal or the desk and a desk and the perplexed chief of staff on a floor and Sally under Sally in every president or a proposal under a floor and Sally and a floor in Sally in a floor on every sandwich or Sally on the floor that Sally pickled that Sally and the president or the proposal with every pickled chief of staff and Sally in a fine president under Sally or Sally in Sally under Sally in every president and the proposal and a president or Sally or Sally under the delicious chief of staff or Sally and a desk or Sally in Sally under Sally or Sally and the pickle under Sally under a desk and every floor with the desk or Sally or Sally in the president under Sally and Sally on Sally in the president and every chief of staff and a pickle with Sally with every chief of staff or the president under every proposal under every president in a pickle or Sally understood Sally and the sandwich and Sally in a sandwich or Sally .

is it true that every very pickled chief of staff sighed with Sally ?

it wanted Sally or Sally on every perplexed pickle on Sally under a president and every desk and a proposal or the chief of staff on every sandwich with the floor under every floor and Sally on Sally and the chief of staff or Sally and Sally and Sally under Sally and Sally or Sally or a pickle in Sally under Sally on Sally with Sally in Sally with a pickle on the sandwich and Sally or the sandwich on a floor on Sally under Sally on Sally on Sally on every pickled sandwich or a sandwich on Sally on Sally and Sally with a proposal on the proposal on a proposal or every proposal under Sally with the perplexed president in Sally and Sally or Sally in the sandwich in Sally and every desk or Sally on Sally and Sally with the proposal in every desk and a pickle and every chief of staff under Sally with Sally and Sally with every sandwich or the sandwich under the very very delicious sandwich or Sally under a pickle under the floor or Sally and every delicious desk and Sally or Sally on Sally or a fine pickle on the chief of staff on a sandwich in the perplexed pickle and the proposal and the fine president on every pickle or Sally or the sandwich and ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... that ... .

Q4.

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(PP (Prep on)

(NP (NP (Det the)

(Noun floor))

(Conj or)

(NP (Pnoun Sally)))))))

(PP (Prep on)

(NP (NP (Det a)

(Noun floor))

(Conj and)

(NP (Det the)

(Noun pickle))))))

(VP (Vi worked)

(PP (Prep in)

(NP (NP (NP (NP (Pnoun Sally))

(PP (Prep under)

(NP (Det a)

(Noun sandwich))))

(PP (Prep in)

(NP (Pnoun Sally))))

(Conj or)

(NP (Pnoun Sally)))))

(Pr that)

(S (NP (NP (NP (NP (Det every)

(Noun floor))

(Conj and)

(NP (Pnoun Sally)))

(PP (Prep on)

(NP (Det the)

(Noun chief

of

staff))))

(Conj and)

(NP (NP (Det the)

(Noun sandwich))

(Conj or)

(NP (Det the)

(Noun president))))

(VP (Vi (Vi (Vi (Vi worked)

(Conj or)

(Vi worked))

(Conj or)

(Vi worked))

(Conj or)

(Vi worked)))))

(VP (Vi sighed)))

Q5.

a)

b)

Yes, of course we have to care about using which one of derivations.

Because two derivation have obviously different meaning with each other. As for the given version, both Preposition Phrase "with a pickle" and "on the floor" embellish the subject phrase----"every sandwich". However, under the other interpretation, only "with a pickle" is for sandwich. The second Preposition Phrase is a part of the Noun Phrase "a pickle on the floor". As a result, it is the pickle that on the floor instead of every sandwich.

This way, first derivation means those sandwiches having a pickle on it are on the floor. While the other derivation means every sandwich whose pickle is on the floor wanted a president.

Thus, the contrary meanings of two derivation make us to care about choosing the appropriate meaning we want.

Q6.

6(a).No, the parser does not always recover the original derivation. Instead, it sometimes finds an alternative derivation. This is because the same sentence can be generated by different grammars, and parser will only find one of them, which is why alternative derivation appear.